



# Philosophy for children and mindfulness during COVID-19: Results from a randomized cluster trial and impact on mental health in elementary school students

Catherine Malboeuf-Hurtubise<sup>a,\*</sup>, Terra Léger-Goodes<sup>b</sup>, Geneviève A. Mageau<sup>c</sup>, Mireille Joussemet<sup>c</sup>, Catherine Herba<sup>d</sup>, Nicholas Chadi<sup>e</sup>, David Lefrançois<sup>f</sup>, Chantal Camden<sup>g</sup>, Ève-Line Bussi  res<sup>h</sup>, Genevi  ve Taylor<sup>i</sup>, Marc-Andr     thier<sup>j</sup>, Mathieu Gagnon<sup>k</sup>

<sup>a</sup> Department of Psychology, Bishop's University, 2600 College St., Sherbrooke, Quebec J1M 1Z7, Canada

<sup>b</sup> Faculty of Medicine and Health Sciences, Universit   de Sherbrooke, Canada

<sup>c</sup> Department of Psychology, Universit   de Montr  al, Canada

<sup>d</sup> Department of Psychology, Universit   du Qu  bec    Montr  al

<sup>e</sup> Department of Paediatrics, Sainte-Justine University Hospital Centre, Canada

<sup>f</sup> Department of Educational Sciences, Universit   du Qu  bec en Outaouais, Canada

<sup>g</sup> School of rehabilitation sciences, Universit   de Sherbrooke, Canada

<sup>h</sup> Department of psychology, Universit   du Qu  bec    Trois-Rivi  res, Canada

<sup>i</sup> Department of Education and Pedagogy, Universit   du Qu  bec    Montr  al, Canada

<sup>j</sup> Department of Didactics, Universit   de Montr  al, Canada

<sup>k</sup> Department of Education, Preschool and Primary school teaching, Universit   de Sherbrooke, Canada

## ABSTRACT

**Background:** Preliminary evidence suggests that the COVID-19 pandemic has had a negative impact on children's mental health. Given these problems can have significant impacts throughout the lifespan, preventing the negative repercussions of COVID-19 on children's mental health is essential. Philosophy for children (P4C) and mindfulness-based interventions (MBIs) show promise in this regard.

**Objective:** The goal of the present study was to compare the impact of online MBI and P4C interventions on mental health, within the context of the COVID-19 pandemic. We used a randomized cluster trial to assess and compare the impact of both interventions on elementary school students' ( $N = 37$ ) anxiety and inattention symptoms as well as on their basic psychological need satisfaction (BPN).

**Results:** ANCOVAs revealed a significant effect of the P4C intervention on mental health difficulties, controlling for baseline levels. Participants in the P4C group showed lower scores on the measured symptoms at post-test than participants in the MBI group. Significant effects of the MBI on levels of BPN were also found. Participants in the MBI intervention reported greater BPN satisfaction at post-test than participants in the P4C intervention.

**Conclusion:** Results from this study suggest that, in the current context of the COVID-19 pandemic, a P4C intervention centered around COVID-19 related themes may be helpful to reduce mental health difficulties, that a MBI may be useful to satisfy BPN, and that both interventions were easy to offer online to elementary school students. Future work including a larger sample size and follow-up measures is warranted.

**Public significance:** Practice: Philosophy for children (P4C) and mindfulness-based interventions (MBIs) can be used to foster mental health in elementary school students, in the current COVID-19 context.

**Policy:** As we do not anticipate that facilitators will be allowed in schools during the 2020–2021 school year and that children will, most likely, be attending school in the current COVID-19 context, policymakers who want to implement psychological support measures in elementary schools should consider an online modality, which has shown in this study to work well, be feasible, and yield positive results on youth mental health.

## 1. Background

Preliminary evidence suggests that the COVID-19 pandemic has had a negative impact on children's mental health, especially on anxiety,

depression and behavioral disorders (Morneau [Shepell, 2020](#)). Indeed, the emerging literature from Asia and Europe suggests that the pandemic is affecting children that were or are still confined to their homes, for whom emotional and behavioral problems may emerge

\* Corresponding author.

E-mail address: [catherine.malboeuf-hurtubise@ubishops.ca](mailto:catherine.malboeuf-hurtubise@ubishops.ca) (C. Malboeuf-Hurtubise).

<https://doi.org/10.1016/j.pnpbp.2021.110260>

Received 2 October 2020; Accepted 17 January 2021

Available online 22 January 2021

0278-5846/   2021 Elsevier Inc. All rights reserved.

(Golberstein et al., 2020; Jiao et al., 2020; Liu et al., 2020; Pisano et al., 2020; Wang et al., 2020). A recent article suggests that these problems may be explained by boredom, family difficulties, or a lack of social interactions (Liu et al., 2020). Before the COVID-19 pandemic, prevalence of mental health problems was reported to be around 25% among elementary school children (Polanczyk et al., 2015). Although the post-COVID-19 prevalence for mental health problems in youth is not yet available, evidence gathered from the emerging literature suggests that the COVID-19 pandemic may increase the development of mental health problems in children overall, and particularly in those who are at higher risk of developing mental illnesses.

Elementary school children, aged 5 to 12 years old, seem particularly affected by the current pandemic, which has led to an increase in mental health problems and psychosocial adaptation problems (Morneau Shepell, 2020). In turn, these problems may hinder academic perseverance and achievement, especially in the context of confinement (Wang et al., 2020). Given that these problems can have significant impacts throughout the lifespan, preventing the negative repercussions of the COVID-19 pandemic on children's mental health by developing interventions adapted to the developmental reality of elementary school children is essential. Empirical results from recent clinical and developmental psychology research suggest that interventions based on social-emotional learning are promising to reduce psychological distress, promote well-being, encourage perseverance in school and foster academic achievement (Jiao et al., 2020).

Children who are gifted intellectually or who have a pre-existing mental health problem (e.g., anxiety disorders or ADHD) seem to be particularly vulnerable to the negative impacts of the current pandemic, especially with regards to their lifestyle, behaviors, and overall health (Degli Espinosa et al., 2020). This highlights the need to offer psychological support to these young students, in the context of the current crisis. Many studies have recommended the implementation of interventions that would provide support during periods of isolation or when going back to school. Although empirical evidence from specific interventions evaluated in the context of COVID-19 is rare, lessons learned from other pandemics or natural disasters indicate that offering resources, such as online services (e.g., tele-health), are promising (Galea et al., 2020). The goal of the present study was thus to assess the efficacy of two group-based, online, developmentally-appropriate interventions and to compare their impact. Specifically, we will assess the impact of a mindfulness-based intervention (MBI) and a philosophy for children (P4C) intervention on mental health, within the context of the COVID-19 pandemic.

### 1.1. Mindfulness-based interventions (MBIs)

Mindfulness refers to paying attention to the present moment openly, and without judgement (Kabat-Zinn, 1994). Mindfulness based interventions (MBIs) specifically adapted to children have been increasingly implemented in school settings in recent years to alleviate psychological distress and improve student mental health (Taylor et al., 2014). They are meant to teach children to focus on their sensory experiences, recognize and accept their thoughts and emotions, leading to better emotional regulation skills (Malboeuf-Hurtubise et al., 2017b). Results from recent meta-analyses and reviews have shown that MBIs are considered useful to decrease mental health problems, such as anxiety and inattention (Carsley et al., 2018; Zenner et al., 2014).

Past research on the effectiveness of MBIs in elementary schools has also suggested that they are useful in fostering positive indicators of mental health, such as wellbeing and basic psychological need (BPN) satisfaction. Indeed, mindfulness has been linked to improvements in the satisfaction of the three BPN for autonomy (to act volitionally and according to one's values and interests), competence (having a significant impact on one's environment) and relatedness (to feel connected to others and to feel like one belongs) (Deci and Ryan, 2000). The degree of satisfaction of each of these BPN is considered a good indicator of an

individual's mental health (Deci and Ryan, 2008). Decades of research have demonstrated that the satisfaction of BPN, especially the need for autonomy, is associated with a better mental health, but also with healthy motivation, academic perseverance, and achievement among elementary school students (Deci and Ryan, 2000). Recently, research suggested that group-based MBIs could have a positive impact on BPN satisfaction in elementary school children (Malboeuf-Hurtubise et al., 2019b). However, other studies have reported null and even negative effects of MBIs on BPN satisfaction (Malboeuf-Hurtubise et al., 2017a; Malboeuf-Hurtubise et al., 2019a). These results highlight the need to further evaluate the potential value of MBIs for improving BPN satisfaction, as well as comparing their effects to the ones of other promising interventions, also easy to implement through the school system.

### 1.2. Philosophy for children (P4C)

Similar to MBIs, philosophy for children (P4C) interventions, in which children are invited to reflect and share on moral issues and personal values, also aim to foster BPN satisfaction, and more specifically the need for autonomy (Niemiec and Ryan, 2009; Sasseville and Gagnon, 2007). As part of P4C workshops, students are faced with different philosophical issues. Starting with a primer, such as a question, a short video, or a picture, a discussion period around a pre-defined philosophical theme can take place (e.g., What is happiness?). As with MBIs, this practice based on dialogue enables children to become aware of their own thoughts and emotions (Lefrançois, 2006; Vansielegheem, 2014). As such, P4C aims to provide a safe space in which children are empowered to think *for* and *by* themselves. This is thought to encourage greater intellectual and affective autonomy, which constitutes the main vehicle to promote better mental health for children (Malboeuf-Hurtubise et al., 2018a).

Research on the effects of P4C has suggested positive impacts on short- and long-term cognitive skills among elementary school children (Topping and Trickey, 2007), as well as on self-esteem and the ability to identify one's emotions and thoughts (Duclos, 2012; Vansielegheem and Kennedy, 2011). However, available evidence is mainly quasi-experimental, highlighting the need for further research on the potential impact of P4C on children's mental health. Given the preliminary data suggesting that P4C shows promise in improving youth mental health and the similarities observed between P4C and MBIs, comparing the impact of both interventions on youth mental health appears relevant to evaluate if P4C can prove to be an interesting alternative to MBIs in school settings.

## 2. Present study

The goal of the present study was to compare the impact of a mindfulness-based intervention (MBI) and a philosophy for children (P4C) intervention, both group-based and delivered online via a teleconferencing platform, on mental health, within the context of the COVID-19 pandemic. We used a randomized cluster trial to assess and compare the impact of both interventions on elementary school students' anxiety and inattention symptoms as well as on their BPN. Given the conflicting existing evidence with regards to MBIs' impact on mental health, we hypothesized that the P4C intervention would have a greater impact on both mental health difficulties and BPN, when compared to the MBI.

## 3. Methods

Five classrooms of elementary school students ( $N = 37$ ; average age = 8.18 years old, 57% boys and 43% girls), from two different school boards, in Quebec, Canada, took part in this study and were randomly allocated to either the MBI (3 classrooms) or P4C (2 classrooms) intervention condition. Descriptive statistics can be found in Table 1. Interventions were offered during the Spring of 2020, during the

**Table 1**  
Descriptive statistics and sample distribution.

Classroom grade	N	Mean age	Condition
« Regular » school			
Multi-age 1st-2nd	6	6,5	MBI
Multi-age 2nd – 3rd	9	7,5	P4C
4th	3	9	MBI
Gifted program			
Multi-age 3rd – 5th	12	9	P4C
Multi-age 2nd – 5th	7	8,75	MBI
Total sample	37	8,18	
Girls	16		
Boys	21		

beginning of the COVID-19 pandemic. Both interventions were delivered online and in real time, using a teleconferencing platform.

Recruitment took part in two schools: (a) 3 classrooms of a rural school that reopened in May 2020 ( $N = 18$ ) and (b) 2 giftedness classrooms of an urban school which remained closed until the end of the study ( $N = 19$ ). All students received the intervention online. Students from the rural region received it while they were in class whereas students from the giftedness program received it at home. The sample size was impacted by the Public Health guidelines, as reopening schools were only allowed to reintegrate 50% of their students to respect physical distancing. Informed consent was obtained from all participating students and their parents as well as from the teachers involved. Randomization occurred immediately after completion of pre-intervention measurements. Students completed pre-intervention (a week before the beginning of the intervention) and post-intervention (a week after the end of the intervention) measurements. A research assistant was present via teleconferencing to help students read all items from the questionnaire package and answering any questions children had about some items. There was no attrition in this study.

#### 4. Procedure

Two distinct five-week interventions were offered. Access to sessions was possible with a secure password-protected video conferencing platform, during which research assistants would log on remotely to join students either at home, or in their classroom (using the classroom's smart board). Parents were not required to be present during sessions. However, for students joining from home, the school board's giftedness educational consultants were present during all sessions. Sessions were led by a dyad of trained undergraduate students in psychology who were blind to the research hypotheses. All had extensive experience leading both P4C and MBI sessions with elementary school students. Supervision was offered weekly by a licensed child psychologist (first author CMH).

The P4C intervention was comprised of five weekly sessions lasting approximately one hour each, during which COVID-19 related themes were discussed with the students. Themes included, in chronological order: 1) Why do we go to school?; 2) Sadness and fear; 3) Personal freedom and rules; 4) Being old; 5) Death. All themes were selected on the basis of their proximity to pandemic-related events. Students were shown short video clips from the French version of the BBC's philosophy television series *What's the Big Idea?* (<https://www.bbc.co.uk/programmes/p045jzgt>), in which a young protagonist is confronted to philosophical enquiries about life. These clips were used as existential primers.

The MBI also consisted of five weekly sessions that lasted approximately one hour each. Activities included in this intervention were: 1) Mindful stopping and taking care of oneself; 2) Body scan; 3) Mindful walking; 4) Mindfulness, gratitude and personal strengths; and 5) Writing my legacy. These activities were adapted from the *Mission Meditation* manual, an evidence-based intervention based on mindfulness meditation and positive psychology, adapted and tailored to fit elementary school children's developmental needs and attention span

(Malboeuf-Hurtubise and Lacourse, 2016).

#### 4.1. Measures

##### 4.1.1. Mental health difficulties

Participants completed selected items from the anxiety (3 items, e.g., “I worry about little things”) and inattention (4 items, e.g., “I forget to do things”) subscales of the *Behavior Assessment Scale for Children-3rd edition, self-report scale* (BASC III) (Reynolds and Kamphaus, 2004). A composite, mean score was used in this study. Internal consistency was acceptable for the total scale ( $\alpha_{pre/post} = 0.69/0.62$ ) in this sample.

##### 4.1.2. BPN satisfaction

Participants rated how competent, autonomous, and related they felt in school, by answering a 5-items scale adapted from a scale used in a previous, similar study (Malboeuf-Hurtubise et al., 2017a; Savard et al., 2013). Children were asked to rate their agreement, on a 5-point Likert scale, with items such as “In school...I feel free to express my ideas” (autonomy); “...I am able to reach my goals” (competence) and “In my relationship with others, I feel appreciated” (relatedness). Internal consistency for the total scale ( $\alpha_{pre/post} = 0.80/0.82$ ) was good in this sample.

#### 4.2. Data analysis

Researchers have suggested using ANCOVAs to increase statistical power in randomized controlled trials (Van Breukelen, 2006). We thus tested hypotheses using analyses of covariance (ANCOVAs), which allowed for a comparison of post-intervention scores in each group, controlling for pre-intervention scores and for school belonging (“regular” rural classroom vs. urban giftedness classroom). Effect sizes were calculated in order to assess the magnitude of observed effects. Post-hoc sensitivity analyses using paired *t*-tests to assess pre-post changes within each intervention were also conducted to examine changes over time.

#### 5. Results

Descriptive statistics can be found in Table 1. Detailed results are presented below and summarized in Tables 2 and 3.

##### 5.1. Mental health difficulties

ANCOVAs revealed a significant effect of condition on mental health difficulties ( $F(1, 29) = 5.58, p = .016$ , partial  $\eta^2 = 0.2$ ), controlling for baseline levels and school belonging. Participants in the P4C group showed lower scores on the measured symptoms at post-test ( $M_{post}$ , adjusted for baseline = 3.67) than participants in the MBI group ( $M_{post}$ , adjusted for baseline = 5.35). There was no effect of school belonging on mental health difficulties.

Sensitivity analyses were conducted using paired *t*-tests. There was a significant pre-to-post decrease in symptoms among students assigned to the P4C condition ( $t(18) = 2.77, p = .01$ ). In contrast, sensitivity analyses were not significant within the MBI group ( $p = .24$ ). Participants in

**Table 2**  
Means and standard deviations for BPN satisfaction and mental health.

Dependent variable	MBI group		P4C group	
	Pre-test (SD)	Post-test (SD)	Pre-test (SD)	Post-test (SD)
BPN satisfaction				
Total need satisfaction	10.43 (3.05)	11.64 (2.57)	9.73 (2.08)	9.38 (2.18)
Mental health difficulties				
BASC-III	4.30 (2.56)	5.00 (2.41)	5.21 (2.09)	3.87 (2.04)

**Table 3**

Results of ANCOVA for positive and negative indicators of mental health.

Variable	df	F	p	Partial $\eta^2$	Statistical power
Positive indicator					
Total need satisfaction	1	7.93	<b>0.009</b>	0.22	0.88
Negative indicator					
BASC-II	1	6.58	<b>0.016</b>	0.20	0.84

the P4C condition showed a decrease in scores from pre-intervention ( $M_{pre} = 5.21$ ) to post-intervention ( $M_{post} = 3.87$ ), whereas symptom levels remained similar among participants in the MBI condition ( $M_{pre} = 4.30$ ;  $M_{post} = 5.00$ ; please refer to [Tables 2 and 3](#)).

## 5.2. BPN satisfaction

ANCOVAs revealed a significant effect of condition on levels of BPN satisfaction ( $F(1, 29) = 7.93, p = .009$ , partial  $\eta^2 = 0.22$ ), controlling for baseline levels and school. Participants in the MBI intervention reported greater BPN satisfaction at post-test ( $M_{post}$ , adjusted for baseline = 11.46), than participants in the P4C intervention ( $M_{post}$ , adjusted for baseline = 9.52). There was no effect of school belonging on BPN satisfaction.

Paired t-tests revealed a significant change within the MBI condition ( $t(13) = -2.14, p = .05$ ) whereas sensitivity analyses were not significant for the P4C condition ( $p = .42$ ). Participants receiving the MBI intervention showed an increase in BPN satisfaction from pre-intervention ( $M_{pre} = 10.43$ ) to post-intervention ( $M_{post} = 11.64$ ). In contrast, participants receiving the P4C intervention showed a slight, non-significant decrease in BPN satisfaction from pre-intervention ( $M_{pre} = 9.73$ ) to post-intervention ( $M_{post} = 9.38$ ).

## 6. Discussion

The goal of this pilot study was to compare the impact of a P4C intervention centered around COVID-19 related themes and a MBI on mental health, in the context of the first wave of the COVID-19 pandemic. Both interventions were delivered online, using a randomized cluster design. Results from this study partially support our initial hypotheses, as they suggest that the P4C intervention was more beneficial to reduce mental health difficulties (anxiety and inattention symptoms) than the mindfulness intervention. However, contrary to our initial hypothesis, the MBI was associated with better outcomes on BPN satisfaction than the P4C intervention. In essence, results indicate that a P4C intervention centered around COVID-19 related themes may be more impactful to reduce symptoms, whereas a MBI may be more useful to improve BPN, in the current context of the COVID-19 pandemic.

Previous research has suggested that P4C may be beneficial to improve BPN satisfaction (especially the need for autonomy), by providing children a discussion space to reflect and share on existential themes and personal values ([Cassidy et al., 2018](#); [Heron and Cassidy, 2018](#); [Malboeuf-Hurtubise et al., 2018a](#)). However, it is noteworthy that our COVID-19 related P4C intervention was not specifically designed to foster in-depth reflections about BPN. Indeed, given that the topics covered were very closely related to pandemic-related events, it is possible that these discussions did not foster greater reflections about one's values or one's satisfaction of autonomy, which could explain, at least in part, why our hypothesis was not supported in this regard. It is also possible that the crisis, probably on children's mind, precluded their cognitive availability to foster immediate short-term growth.

Rather, the objective behind our P4C intervention was to provide a safe space in which students would have the opportunity to reflect and openly discuss existential questions they had inevitably encountered due to the recent global pandemic. As such, providing students with the opportunity to discuss difficult topics such as "What does it mean to be old?" or "Fear of becoming sick and death" may have been especially useful to decrease psychological distress, often manifested in anxiety

and inattention symptoms. Indeed, past clinical research on third wave cognitive behavioral therapies has shown that openly discussing, normalizing and acknowledging difficult topics or feelings can help decrease psychological distress, in adults and children alike ([Swain et al., 2013](#)). It is quite possible the P4C intervention acted in a similar fashion in the present study.

The MBI offered to students during the beginning of the pandemic yielded beneficial results with regards to BPN satisfaction. It is possible that the inclusion of positive psychology activities, such as reflecting on one's legacy, sense of gratitude, and personal strengths, provided such a space for students to reflect on their values and sense of self. However, contrary to the P4C intervention, the MBI implemented in this study was not focused specifically on ongoing current events, which could explain, at least in part, why it did not help reducing symptoms - and why the P4C intervention was more beneficial in this regard. It should be noted, however, that pandemic-related discussions were not forbidden in the MBI group. Indeed, the topic of COVID-19 was brought up on a few occasions by participants during group discussions, and provided that they were related to the MBI activities, students were given the space to discuss current events. Nonetheless, these discussions did not occupy a significant place in the overall intervention.

It is possible that group discussions in the P4C group provided students with an understanding that their concerns were normal and that perhaps many of their peers felt the same way. Alternatively, seeing other peers being less distressed about the pandemic might have helped some participants in the P4C group regulate their own emotions. This being said, previous research on MBIs in elementary school settings and with youth has shown mindfulness to be somewhat effective to decrease anxiety and inattention symptoms ([Carsley et al., 2018](#); [Zenner et al., 2014](#)), although studies in which null and negative effects were observed have also been published ([Britton et al., 2014](#); [Malboeuf-Hurtubise et al., 2019a](#); [Malboeuf-Hurtubise et al., 2018b](#)). It is also possible that the duration of the intervention itself was not sufficient to provide a significant impact on mental health difficulties in our participants, since MBIs typically last 8–10 weeks. Lastly, the combination of positive psychology and mindfulness meditation could also explain why the intervention had more of an impact on BPN satisfaction than mental health difficulties.

Overall, results from this study suggest that both interventions have some potential to improve mental health of elementary school students, over a five-week intervention period. However, given that both interventions had distinct effects on mental health, perhaps combining both interventions would yield stronger effects on overall mental health in elementary school students. Indeed, both approaches show a certain complementarity with regards to their impact on mental health: MBIs, on one hand, are based on introspection and free identification of thoughts, emotions and physical sensations, while being non-directive. P4C, on the other hand, is a more directive approach in which specific themes are proposed to students. Hence, MBIs can be helpful to identify thoughts, emotions or personal values and may provide fertile grounds for P4C activities to yield more in-depth reflections about these same topics. In turn, these reflections can also allow for a clarification of one's thoughts, emotions, and overall BPN satisfaction ([Brown, 2015](#); [Brown and Ryan, 2003](#); [Levesque and Brown, 2007](#); [Malboeuf-Hurtubise et al., 2018a](#)). It would thus be interesting to evaluate the impact of a combined P4C and MBI intervention on mental health in elementary school students and in the context of the COVID-19 pandemic. In doing so, it would also be suggested to compare the impact of a combined intervention and of both interventions taken separately. As the 2020–2021 school year will, in all likelihood, continue to be impacted by the COVID-19 pandemic, future work could aim to integrate this suggestion.

From a feasibility standpoint, the present study shows that both P4C and MBIs can easily be implemented online and in real time with elementary school children. This is particularly convenient in the context of the COVID-19 pandemic. Indeed, anecdotal evidence from teachers, students and their parents show that both interventions were



well accepted and appreciated by participating children and their caretakers. Even though our research team faced a few technical issues during the implementation of some online sessions, the quality of group discussions was not significantly deteriorated in either condition, and teachers were willing and happy to assist in ensuring the project would run smoothly on their end. Facilitators did not experience obstacles in leading meditations remotely, and the material from both interventions did not require any adaptation because of their online delivery. As we do not anticipate that facilitators will be allowed in schools during the 2020–2021 school year and that children will, most likely, be attending school, knowing that the online modality works well, is feasible, and yields positive results on youth mental health is quite encouraging.

Future iterations of similar projects in the upcoming school year/s could include longer interventions, with follow-up measures to assess whether observed effects are maintained throughout the school year. In the present study, and in the context of schools reopening in Quebec, we only disposed of 5 weeks before the end of the 2019–2020 academic year to implement both interventions. Longer interventions could perhaps be more useful to improve mental health among elementary school children.

Finally, we suggest that future studies aim to recruit larger samples, which would allow sufficient power to detect small effects and examine moderation by age, sex or psychosocial characteristics at baseline. However, it should be noted that school belonging (i.e. regular classroom or giftedness program) did not significantly impact results in this study. Thus, these preliminary results tend to indicate that both interventions had similar effects, regardless of children being gifted or not. To date, full-time and province-wide school reopening have been announced for the 2020–2021 academic year in Quebec, which leads us to anticipate easier recruitment and larger sample sizes in the upcoming year. This would indeed help to test for the robustness of our results and to ensure adequate statistical power to detect pre-to-post and between group differences in future iterations of similar studies on children's mental health during the COVID-19 pandemic, as well as to detect who responds best to each intervention. It should be mentioned, however, that the achieved power in this study was considered adequate.

## 7. Conclusion

In sum, results from this study suggest that in the current context of the COVID-19 pandemic, a P4C intervention centered around COVID-19 related themes may be helpful to reduce mental health difficulties (anxiety and inattention symptoms), that a MBI may be useful to satisfy basic psychological needs, and that both interventions were easy to offer online to elementary school students. Nonetheless, we recommend that future work includes a larger sample size and follow-up measures to evaluate the long-term impact of both interventions on children's overall mental health.

## Ethics approval and consent to participate

This study was approved by the Bishop's University Research and Ethics Board (file 101,936, date of approval: January 21st 2019). Participation in this study was voluntary. Written consent was obtained from each participant and their parents, as well as from all teachers taking part in this study.

## Funding

This research was funded through grants received by Bishop's University support to new faculty fund, as well as by the Social Sciences and Humanities Research Council of Canada to CMH. Funding agencies played no role in the design, administration or interpretation of research data for this study.

## Human rights

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study was approved by the Bishop's University Research and Ethics Board (file 101936, date of approval: January 21st 2019).

## Informed consent

Informed consent was obtained from all individual participants included in the study.

## Declaration of Competing Interest

CM-H has released a manual on the mindfulness-based intervention described and used in this study (Midi Trente Publishers).

The remaining authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## Acknowledgements

The authors wish to express their sincere gratitude to the school educator, teachers and principal who made this study possible.

## References

- Britton, W.B., Lepp, N.E., Niles, H.F., Rocha, T., Fisher, N.E., Gold, J.S., 2014. A randomized controlled pilot trial of classroom-based mindfulness meditation compared to an active control condition in sixth-grade children. *J. Sch. Psychol.* 52 (3), 263–278.
- Brown, K.W., 2015. Mindfulness training to enhance positive functioning. In: Brown, K.W., Creswell, J.D., Ryan, R.M. (Eds.), *Handbook of Mindfulness: Theory, Research, and Practice*. Guilford Publications.
- Brown, K.W., Ryan, R.M., 2003. The benefits of being present: mindfulness and its role in psychological well-being. *J. Pers. Soc. Psychol.* 84 (4), 822.
- Carsley, D., Khoury, B., Heath, N.L., 2018. Effectiveness of mindfulness interventions for mental health in schools: a comprehensive meta-analysis. *Mindfulness* 9 (3), 693–707.
- Cassidy, C., Marwick, H., Deeney, L., McLean, G., 2018. Philosophy with children, self-regulation and engaged participation for children with emotional-behavioural and social communication needs. *Emot. Behav. Diffic.* 23 (1), 81–96 (2018/01/02). <https://doi.org/10.1080/13632752.2017.1388654>.
- Deci, E.L., Ryan, R.M., 2000. Self-determination theory and the facilitation of intrinsic motivation. *Am. Psychol.* 55, 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>.
- Deci, E.L., Ryan, R.M., 2008. Facilitating optimal motivation and psychological well-being across life's domains. *Can. Psychol.* 49 (1), 14.
- Degli Espinosa, F., Metko, A., Raimondi, M., Impenna, M., Scognamiglio, E., 2020. A model of support for families of children with autism living in the COVID-19 lockdown: lessons from Italy. *Behav. Anal. Pract.* 1.
- Duclos, A., 2012. *La philosophie pour enfants comme outil de compréhension des émotions*. Presses Académiques de France.
- Galea, S., Merchant, R.M., Lurie, N., 2020. The mental health consequences of COVID-19 and physical distancing: the need for prevention and early intervention. *JAMA Intern. Med.* 180 (6), 817–818.
- Golberstein, E., Wen, H., Miller, B.F., 2020. Coronavirus disease 2019 (COVID-19) and mental health for children and adolescents. *JAMA Pediatr.* 174 (9), 819–820. <https://doi.org/10.1001/jamapediatrics.2020.1456>.
- Heron, G., Cassidy, C., 2018. Using practical philosophy to enhance the self-regulation of children in secure accommodation. *Emot. Behav. Diffic.* 23 (3), 254–269 (2018/07/03). <https://doi.org/10.1080/13632752.2018.1461469>.
- Jiao, W.Y., Wang, L.N., Liu, J., Fang, S.F., Jiao, F.Y., Pettoello-Mantovani, M., Somekh, E., 2020. Behavioral and emotional disorders in children during the COVID-19 epidemic. *J. Pediatr.* 221, 264.
- Kabat-Zinn, J., 1994. Wherever you go, there you are: mindfulness meditation in everyday life. *Hyperion* 78–80.
- Lefrançois, D., 2006. Participation and citizenship education: is the citizen free only during parliamentary elections? *Anal. Teach.* 26 (1), 21–29.
- Levesque, C., Brown, K.W., 2007. Mindfulness as a moderator of the effect of implicit motivational self-concept on day-to-day behavioral motivation. *Motiv. Emot.* 31 (4), 284–299.
- Liu, J.J., Bao, Y., Huang, X., Shi, J., Lu, L., 2020. Mental health considerations for children quarantined because of COVID-19. *Lancet Child Adolescent Health* 4 (5), 347–349.

- Malboeuf-Hurtubise, C., Lacourse, É., 2016. *Mission Méditation: Pour des élèves épanouis, calmes et concentrés* (Éditions Midi Trente).
- Malboeuf-Hurtubise, C., Joussemet, M., Taylor, G., Lacourse, E., 2017a. Effects of a Mindfulness-Based Intervention on the Perception of Basic Psychological Need Satisfaction among Special Education Students. *International Journal of Disability, Development and Education*, pp. 1–12. <https://doi.org/10.1080/1034912X.2017.1346236>.
- Malboeuf-Hurtubise, C., Lacourse, E., Taylor, G., Joussemet, M., Amor, L.B., 2017b. A mindfulness-based intervention pilot feasibility study for elementary school students with severe learning difficulties: effects on internalized and externalized symptoms from an emotional regulation perspective. *J. Evidence-Based Comp. Alt. Med.* 22 (3), 473–481. <https://doi.org/10.1177/2156587216683886>.
- Malboeuf-Hurtubise, C., Lefrançois, D., Taylor, G., 2018a. Le rôle potentiel de la philosophie pour enfants et de la présence attentive dans le développement de l'autodétermination chez des élèves du primaire. *Spirale* 62, 123–140.
- Malboeuf-Hurtubise, C., Taylor, G., Paquette, L., Lacourse, E., 2018b. A mindfulness-based intervention for students with psychiatric disorders in a special education curriculum: a series of n-of-1 trials on internalized and externalized symptoms [original research]. *Front. Edu.* 3 (66) <https://doi.org/10.3389/feduc.2018.00066> (2018-September-03).
- Malboeuf-Hurtubise, C., Taylor, G., Mageau, G.A., 2019a. Impact of a mindfulness-based intervention on basic psychological need satisfaction and internalized symptoms in elementary school students with severe learning disabilities: results from a randomized cluster trial [original research]. *Front. Psychol.* 10 (2715) <https://doi.org/10.3389/fpsyg.2019.02715> (2019-December-06).
- Malboeuf-Hurtubise, C., Taylor, G., Nguyen, S., Thibault-Landry, A., Mageau, G.A., Baldwin, M., 2019b. Impact of a mindfulness-based intervention on autonomy in elementary school students: Results from a randomized cluster trial. In: 7th International Self-Determination Theory Conference. The Netherlands, Amsterdam.
- Niemiec, C.P., Ryan, R.M., 2009. Autonomy, competence, and relatedness in the classroom: applying self-determination theory to educational practice. *Theory Res. Educ.* 7, 133–144. <https://doi.org/10.1177/1477878509104318>.
- Pisano, L., Galimi, D., Cerniglia, L., 2020. A Qualitative Report on Exploratory Data on the Possible Emotional/Behavioral Correlates of Covid-19 Lockdown in 4–10 Years Children in Italy.
- Polanczyk, G.V., Salum, G.A., Sugaya, L.S., Caye, A., Rohde, L.A., 2015. Annual research review: a meta-analysis of the worldwide prevalence of mental disorders in children and adolescents. *J. Child Psychol. Psychiatry* 56 (3), 345–365.
- Reynolds, C.C., Kamphaus, R.W., 2004. *The Behavior Assessment System for Children*, Second edition. AGS Publishing.
- Sasseville, M., Gagnon, M., 2007. *Penser ensemble à l'école: des outils pour l'observation d'une communauté de recherche philosophique en action*. Presses de l'Université Laval.
- Savard, A., Joussemet, M., Pelletier, J.E., Mageau, G.A., 2013. The benefits of autonomy support for adolescents with severe emotional and behavioral problems. *Motiv. Emot.* 1–13.
- Shepell, Morneau, 2020. Indice de santé mentale, Canada, Avril 2020. In: *Pleins feux sur l'incidence de la pandémie de COVID-19 sur la santé mentale*.
- Swain, J., Hancock, K., Hainsworth, C., Bowman, J., 2013. Acceptance and commitment therapy in the treatment of anxiety: a systematic review. *Clin. Psychol. Rev.* 33 (8), 965–978.
- Taylor, G., Jungert, T., Mageau, G.A., Schattke, K., Dedic, H., Rosenfield, S., Koestner, R., 2014. A self-determination theory approach to predicting school achievement over time: the unique role of intrinsic motivation. *Contemp. Educ. Psychol.* 39 (4), 342–358.
- Topping, K.J., Trickey, S., 2007. Collaborative philosophical enquiry for school children: cognitive effects at 10–12 years. *Br. J. Educ. Psychol.* 77 (2), 271–288.
- Van Breukelen, G.J., 2006. ANCOVA versus change from baseline had more power in randomized studies and more bias in nonrandomized studies. *J. Clin. Epidemiol.* 59 (9), 920–925.
- Vansieleghe, N., 2014. What is philosophy for children? From an educational experiment to experimental education. *Educ. Philos. Theory* 46, 1300–1310. <https://doi.org/10.1080/00131857.2013.771442>.
- Vansieleghe, N., Kennedy, D., 2011. What is philosophy for children, what is philosophy with children—after Matthew Lipman? *J. Philos. Educ.* 45 (2), 171–182.
- Wang, G., Zhang, Y., Zhao, J., Zhang, J., Jiang, F., 2020. Mitigate the effects of home confinement on children during the COVID-19 outbreak. *Lancet* 395 (10228), 945–947.
- Zenner, C., Herrnleben-Kurz, S., Walach, H., 2014. Mindfulness-based interventions in schools—a systematic review and meta-analysis. *Front. Psychol.* 5.